

PATENT APPLICATION
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of

Docket No: Q80694

Tsutomu TAKAYAMA, *et al.*

Appln. No.: 10/811,977

Group Art Unit: 3726

Confirmation No.: 3001

Examiner: Rick Kilatae CHANG

Filed: March 30, 2004

For: METHOD AND APPARATUS OF DETERMINING ACCEPTABILITY OF PRESS
CONTACT TERMINAL

APPEAL BRIEF UNDER 37 C.F.R. § 41.37

MAIL STOP APPEAL BRIEF - PATENTS

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In accordance with the provisions of 37 C.F.R. § 41.37, Appellant submits the following:

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Appeal Brief
U.S. Application No.: 10/811,977

Attorney Docket No.: Q80694

I. REAL PARTY IN INTEREST

As evidenced by an Assignment from the co-inventors that was duly recorded in the U.S. Patent and Trademark Office as of March 30, 2004, on Reel 015161 at Frame 0253, the real party in interest herein is YAZAKI CORPORATION.

II. RELATED APPEALS AND INTERFERENCES

Appellants and the undersigned attorney are not aware of any related appeals or interferences.

III. STATUS OF CLAIMS

Claims 1-26 are all the claims pending in the application. Claims 1, 2, and 4-26 are withdrawn from consideration as unelected claims in response to a restriction requirement. Claim 3 presently stands finally rejected.

Claim 3 is rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter.

Claim 3 is rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,271,254 to Gloe et al. (hereinafter "Gloe").

No other ground of rejection or objection is presently pending.

A copy of the pending claim on appeal is set forth in the attached Appendix.

IV. STATUS OF AMENDMENTS

With the filing of this Brief, all Amendments have been entered and considered by the Examiner.

The application was originally filed with claims 1-26.

Appellant filed a Response to a Restriction Requirement in which claim 3 was elected on October 23, 2006, in response to the Office Action mailed on August 21, 2006.

Appellant filed an Amendment under 37 C.F.R. § 1.111 on April 3, 2007, in response to the Office Action mailed on January 4, 2007.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

The following is a concise explanation of the subject matter defined in the claim involved in the appeal.

For the Board's convenience, Appellants will first describe the relevant art (pages 1-8 of the Specification), and then the claim with reference to the exemplary embodiments of the invention (pages 8-220 of the Specification). This discussion of the exemplary embodiments and the pending claim is provided for explanatory purposes only, and is not intended to limit the scope of the claim.

Generally, the invention relates to a method and an apparatus for determining acceptability of a press contact terminal by predicting contact loads between press contact blades and a core wire when an electric wire is inserted between the press contact blades or the like. *See* Specification at page 1, lines 5-9.

Related Art

Various electronic apparatus are mounted on an automobile. The automobile is wired with a wire harness for transmitting a predetermined power and signal to the electronic apparatus. The wire harness is provided with a plurality of electric wires and connectors attached to end portions of the electric wires. *See* Specification at page 1, lines 11-16.

The electric wire includes a conductive core wire and an insulating sheath portion for covering the core wire. The connector is provided with a terminal metal piece attached to the electric wire and a connector housing containing the terminal metal piece. The terminal metal

piece is made of a conductive drawn sheet or the like. The terminal metal piece is electrically connected to the core wire of the electric wire. The connector housing is made of an insulating synthetic resin and formed in a box-like shape. *See* Specification at page 1, line 18 to page 2, line 1.

A press contact terminal may be used as the terminal metal piece of the wire harness. The press contact terminal is provided with a bottom wall for positioning the core wire of the electric wire on a surface thereof, a pair of side walls erected from opposite edges of the bottom wall, and press contact blades extending towards each other from the pair of side walls. The electric wire is inserted between the press contact blades. The press contact blades are brought into contact with the core wire by cutting the sheath portion. In this way, the press contact terminals are electrically connected to the electric wire. The press contact terminals are attached to the connector housing. *See* Specification at page 2, lines 9-22.

When the electric wire is inserted between the press contact blades, the side walls of the press contact terminals may be pushed outwards, increasing the distance between the side walls. When the electric wire is inserted, the press contact blades are brought into contact with the core wire by cutting the sheath portion. Therefore, a load is generated, hampering the insertion of the wire. Thus, the electric wire is inserted between the press contact blades by a force exceeding the load. *See* Specification at page 2, line 24 to page 3, lines 11.

When the load is excessively increased, it is conceivable that the press contact terminal will be abnormally deformed or chipped off. In a state of attaching the press contact terminal to

the connector housing, it is conceivable that the connector housing is destroyed. *See* Specification at page 3, lines 13-17.

Because of these potential problems, in developing the press contact terminal, the electric wire is inserted between the press contact blades and the load and the expansion of the interval between the side walls is measured. A relationship between the load and the expansion of the interval between the side walls is calculated and the acceptability of design of the press contact terminal is determined based on the relationship. *See* Specification at page 3, line 19 to page 4, line 1.

At the time of a mass production after completing the design, the press contact terminal is brought into press contact with the electric wire and contained in the connector housing to constitute the wire harness. In order to maintain/improve quality of the wire harness, it is useful to calculate the relationship between the expansion of the interval between the side walls and the load in bringing the electric wire into press contact therewith. It is desired to determine acceptability of the press contact terminal based on this relationship. *See* Specification at page 4, lines 3-13.

The loads are based on contact loads between the core wire and the press contact blades. Various measuring apparatus have been proposed to measure the loads, that is, the contact loads. *See* Specification at page 4, lines 15-18.

A first measuring apparatus consists of strain gage type load cells on outer sides of the pair of side walls of a trially produced press contact terminal. Front ends of the load cells are brought into contact with outer faces of the side walls of the press contact terminal before press

contact. The measuring apparatus measures the contact loads by inserting the electric wire between the press contact blades and measuring loads applied on the load cells. However, this makes it more difficult to separate the pair of side walls from each other. Therefore, the loads applied on the load cells tend to be larger than the contact loads between the press contact blades and the core wire of the actual press contact terminal. Thus, the contact loads between the press contact blades and the core wire cannot accurately be measured. Also, it is difficult to accurately measure the expansion of the interval between the side walls. *See* Specification at page 4, line 20 to page 6, line 9.

A second measuring apparatus consists of a pair of laser displacement meters used to measure the expansion of the interval between the pair of side walls of the press contact terminal. But, the angle made by a surface of the bottom wall and a surface of the side wall is changed before press contact and after press contact. Thus, the portion of the side wall on which the laser impinges is shifted before press contact and after press contact. Therefore, it is conceivable that the laser displacement meter cannot accurately measure the displacement of the side wall. *See* Specification at page 6, line 24 to page 8, line 12.

Claim 3

Claim 3 is directed to a method of determining acceptability of a press contact terminal including press contact blades which are separated from each other when the wire is inserted between the press contact blades so that a core wire of the wire is electrically connected to the press contact terminal. The claim recites storing a reference data showing a relationship between displacements of the press contact blades when the wire is brought into press contact with a

normal one of the press contact terminal and contact loads between the press contact blades and the core wire; inserting the wire between the press contact blades of the press contact terminal as an object to be inspected; measuring the displacement of the press contact blades caused by the insertion of the wire; and determining the acceptability of the press contact terminal as the object to be inspected by predicting the contact loads between the press contact blades of the press contact terminal as the object to be inspected based on the measured displacements and the reference data.

An embodiment of the method of determining acceptability of a press contact terminal is described on page 34, line 1 through page 37, line 2 of the Specification. A determining apparatus 1 stores reference data showing a relationship between displacements of the press contact blades when the wire is brought into press contact with a normal one of the press contact terminal and contact loads between the press contact blades and the core wire (*see* Specification, page 34, line 13 to page 35, line 1); inserting the wire between the press contact blades of the press contact terminal as an object to be inspected (*see* Specification, page 36, lines 13-15); measuring the displacement of the press contact blades caused by the insertion of the wire (*see* Specification, page 36, lines 15-20); and determining the acceptability of the press contact terminal as the object to be inspected by predicting the contact loads between the press contact blades of the press contact terminal as the object to be inspected based on the measured displacements and the reference data (*see* Specification, page 36, line 20 to page 37, line 2).

Accordingly, the present invention is able to overcome deficiencies in the prior art and accurately determine acceptability of the press contact terminal for inserting an electric wire between press contact blades.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Whether claim 3 is unpatentable over 35 U.S.C. § 101 as being directed to non-statutory subject matter.
2. Whether claim 3 is unpatentable over 35 U.S.C. § 102(b) as being anticipated by Gloe.

VII. ARGUMENT

1. Claim 3 is allegedly unpatentable over 35 U.S.C. § 101 as being directed to non-statutory subject matter.

Appellants respectfully submit that claim 3 is directed to statutory subject matter and is not merely directed to an abstract idea, as the Examiner alleges.

2. Claim 3 is allegedly unpatentable over 35 U.S.C. § 102(b) as being anticipated by Gloe.

Appellants respectfully submit that claim 3 is not anticipated by Gloe, as the Examiner alleges.

The Prior Art References

A brief discussion of the reference the Examiner cites in support of the claim rejection is presented here for the Board's convenience.

Gloe

Gloe generally relates to a method of monitoring the quality of a crimped electrical connection and to apparatus for crimping an electrical terminal to a wire and being provided with means for monitoring the quality of the crimped connection between the terminal and the wire (*see* col. 1, lines 11-16).

According to Gloe, an effective crimped connection between a wire and a terminal may, for a variety of reasons, not be achieved (*see* col. 5, lines 10-12). Gloe further discloses that not all faults can be detected by measuring the peak value of the crimping force and comparing it with a correct reference value of that force (*see* col. 5, lines 41-43). Gloe discloses that because

of this, in addition to measuring the peak value of the crimping force, its incremental values and/or the total work performed by the die assembly should be measured (*see* col. 5, lines 50-55). Incremental values are encoded into a crimping force envelope (*see* col. 6, lines 24-29).

According to Gloe, an operator enters an ideal, reference crimping force envelope into the ideal envelope memory, and the actual crimping force is compared with the ideal envelope (*see* col. 6, line 47-col. 7, line 6). Additionally, the peak value of the actual crimping force and the total work of the actual crimping force are compared with the ideal envelope (*see* col. 6, line 65-col. 7, line 6).

Gloe also discloses that when the actual values deviate by more than a certain percentage from the ideal envelope, a failure signal is generated, which may result in the disabling of the motor. Alternatively, Gloe discloses that when the actual values are within a certain percentage of the ideal envelope, a success signal is generated. *See* col. 7, lines 12-41.

Claim Rejection under 35 U.S.C. § 101

With regard to the 35 U.S.C. § 101 rejection of claim 3, the Examiner alleges that claim 3 is an abstract idea rather than a practical application of the idea. The Examiner alleges that a physical transformation does not result nor is a useful, concrete, and tangible result provided. *See* page 2 of the Office Action mailed on June 14, 2007.

The Examiner argues that the reference data can be provided by performing mathematical calculations or acquired knowledge from previous experience. Since the reference data is stored in a hard drive or RAM, the Examiner alleges there is no tangible result. As to the inserting step,

the Examiner alleges that claim 3 fails to provide a relative location of contact blades before the wire is inserted.

Appellants respectfully disagree with the Examiner's contention that claim 3 is an abstract idea rather than a practical application of an idea. Appellants respectfully submit that claim 3 is directed to statutory subject matter.

A physical transformation is one example of how an abstract idea may produce a useful result and fall within 35 U.S.C. § 101. *See, e.g., AT&T Corp. v. Excel Communs., Inc.*, 172 F.3d 1352, 1359 (Fed. Cir. 1999).

Claim 3 results in just such a physical transformation. For example, claim 3 recites "inserting the wire between the press contact blades of the press contact terminal." Thus, a physical transformation occurs as the wire is inserted (a physical operation) between the press contact blades of the press contact terminal. The claim further recites, "press contact blades which are separated from each other when the wire is inserted between the press contact blades." Thus, the separation of the press contact blades when the wire is inserted is a physical transformation. The Examiner's argument that the claim fails to provide a relative location of the contact blades before the wire is inserted is irrelevant; the claim discloses that the press contact blades are separated from each other when the wire is inserted.

Claim 3 further recites "storing a reference data." The act of storing reference data entails a physical operation of some sort resulting in a physical transformation. The Examiner's argument that the reference data can be provided by mathematical calculations or acquired knowledge is irrelevant; the physical transformation occurs in the storing of the reference data.

Because claim 3 recites a number of concrete steps resulting in physical transformations, Appellants respectfully submit that claim 3 is directed to statutory subject matter and is patentable under 35 U.S.C. § 101.

Claim Rejection under 35 U.S.C. § 102(b)

With regard to the 35 U.S.C. § 102(b) rejection of claim 3, the Examiner alleges that Gloe teaches each of the features recited in claim 3. Appellants respectfully disagree.

The Examiner alleges that Gloe discloses in FIG. 5 crimping a terminal with a wire located therein. The Examiner further alleges that Gloe discloses in FIGS. 8-15 different graphs showing the various shapes of the crimped terminals and calculations to determine the location of the wires whether it is inside or outside of the terminal. The Examiner still further alleges that FIG. 6 of Gloe discloses the acquiring step. *See* page 2 of the Office Action mailed on June 14, 2007.

Appellants respectfully note that the Examiner has not alleged that Gloe discloses each of the limitations set forth in claim 3. The Examiner's allegations are thus not sufficient to sustain a rejection under 35 U.S.C. § 102(b). The Examiner's response to Appellant's arguments in the Amendment under 37 C.F.R. § 1.111 filed on April 3, 2007, fails to address Appellant's position that Gloe does not disclose each of the limitations recited in claim 3 (*see* page 3 of the Office Action mailed on June 14, 2007).

Appellants respectfully submit that Gloe does not disclose each of the limitations of claim 3. For example, Gloe does not disclose "storing a reference data showing a relationship between displacements of the press contact blades when the wire is brought into press contact

with a normal one of the press contact terminal and contact loads between the press contact blades and the core wire.”

Instead, according to Gloe, the operator enters an ideal, reference, crimping force envelope EI into an ideal envelope memory EIM, the envelope EI being obtained, by using an applicator 44 which is in optimum condition with a die assembly 48 and an anvil 58, also in optimum condition, to crimp several terminals T, in this example eight terminals, which are also in optimum condition, to wires W of the correct gauge for the terminals and the end portions of which have been correctly stripped of insulation; to provide respective envelopes EA with the aid of an incremental encoder and a load cell. According to Gloe, if all of the connections are good, the average of the eight envelopes EA is then taken and is entered into the memory EIM as the ideal envelope EI (*see* col. 6, lines 47-58).

Gloe discloses that the actual crimping force envelope EA is produced by the incremental encoder 30, which cooperates with the load cell 96, plotting the actual crimping force F applied by the die assembly 48 to a terminal T on anvil 58, against the angular position AP of the stub shaft 78. The envelope EA is thus derived from the incremental values IV of the force F generated within a measuring window MW over approximately 45 degrees either side of the bottom dead center position (180 degrees) of the ram 22, that is to say in the angular positions of the shaft 78 during which the die assembly 48 is in contact with the terminal T, the peak value PV of the force F being attained at least proximate to said bottom dead center position of the ram 22. *See* col. 6, lines 24-40.

Thus, according to Gloe, the ideal envelope memory stores an ideal, reference, crimping force envelope. The ideal, reference, crimping force envelope is derived from averages of incremental values IV of the force F generated within a measuring window MW. This is not the same as storing a reference data showing a relationship between displacements of the press contact blades when the wire is brought into press contact with a normal one of the press contact terminal and contact loads between the press contact blades and the core wire, as recited in claim 3.

The incremental values IV of the force F generated within a measuring window MW, disclosed in Gloe, are not the same as the displacements of the press contact blades, recited in claim 3. Force is fundamentally different from displacement. Furthermore, Gloe does not disclose the press contact blades recited in claim 3. As one of ordinary skill in the art would certainly be aware, crimping barrels as disclosed in Gloe (*see* Abstract) are not the same as press contact blades as recited in claim 3.

Thus, Gloe does not disclose “storing a reference data showing a relationship between displacements of the press contact blades when the wire is brought into press contact with a normal one of the press contact terminal and contact loads between the press contact blades and the core wire.”

Gloe also fails to disclose “inserting the wire between the press contact blades of the press contact terminal as an object to be inspected,” as recited in claim 3. As discussed above, Gloe relates to crimping barrels and crimped connections, not press contact blades as recited in claim 3. Gloe discloses that crimped connections are produced by the application of a

compressive force to a crimping barrel of an electrical terminal, with a wire therein (*see* col. 1, lines 19-23). Press contact blades, on the other hand, are electrically connected to an electric wire by press contact blades being brought into contact with a core wire by cutting the sheath portion when the electric wire is inserted between the press contact blades (*see* page 2, lines 16-21 of the Specification).

Gloe does not disclose that the wire is inserted between the press contact blades of the press contact terminal as an object to be inspected, as recited in claim 3. Instead, Gloe only discloses crimped connections and crimping barrels, which are not the same as press contact blades.

Gloe also fails to disclose “measuring the displacement of the press contact blades caused by the insertion of the wire,” as recited in claim 3. As discussed above, Gloe does not disclose press contact blades. Also, as discussed above, Gloe discloses the measuring of force, not displacement. Force is not the same as displacement. Thus, Gloe does not disclose this feature, as recited in claim 3.

Gloe further fails to disclose “determining the acceptability of the press contact terminal as the object to be inspected by predicting the contact loads between the press contact blades of the press contact terminal as the object to be inspected based on the measured displacement and the reference data,” as recited in claim 3.

Instead, Gloe discloses monitoring the quality of a crimped connection (*see* col. 1, lines 19-25), which, as discussed above, is not the same as a press contact terminal.

Furthermore, Gloe monitors the quality of the crimped connection by comparing actual crimping

force F, the peak value PV of the actual crimping force F, and the total work TW, with that of the ideal envelope EI (*see* col. 6, line 64-col. 7, line 6). Claim 3, however, recites that the acceptability of the press contact terminal is determined not by comparing various measured force values, as disclosed in Gloe, but instead by predicting the contact loads based on measured displacement and the reference data. Thus, the disclosure of Gloe is not the same as “determining the acceptability of the press contact terminal as the object to be inspected by predicting the contact loads between the press contact blades of the press contact terminal as the object to be inspected based on the measured displacement and the reference data,” as recited in claim 3.

Appellants respectfully submit that claim 3 is patentable over Gloe because Gloe does not disclose each of the elements recited in claim 3.

VIII. CONCLUSION

Unless a check is submitted herewith for the fee required under 37 C.F.R. §41.37(a) and 1.17(c), please charge said fee to Deposit Account No. 19-4880.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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65565

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CLAIMS APPENDIX

CLAIM ON APPEAL:

3. A method of determining acceptability of a press contact terminal including press contact blades which are separated from each other when the wire is inserted between the press contact blades so that a core wire of the wire is electrically connected to the press contact terminal, the method comprising the steps of:

storing a reference data showing a relationship between displacements of the press contact blades when the wire is brought into press contact with a normal one of the press contact terminal and contact loads between the press contact blades and the core wire;

inserting the wire between the press contact blades of the press contact terminal as an object to be inspected;

measuring the displacement of the press contact blades caused by the insertion of the wire; and

determining the acceptability of the press contact terminal as the object to be inspected by predicting the contact loads between the press contact blades of the press contact terminal as the object to be inspected based on the measured displacements and the reference data.

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MAIL STOP APPEAL BRIEF - PATENTS

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Submitted herewith please find an Appeal Brief. The statutory fee of \$510.00 is being paid via the USPTO Electronic Filing System (EFS). The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account. A duplicate copy of this paper is attached.

Respectfully submitted,

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